



**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**In re Application of:**

Salman Akram

**Serial No.:** 09/388,031

**Filed:** September 1, 1999

**For:** METALLIZATION STRUCTURES  
FOR SEMICONDUCTOR DEVICE  
INTERCONNECTS, METHODS FOR  
MAKING SAME, AND  
SEMICONDUCTOR DEVICES  
INCLUDING SAME

**Confirmation No.:** 3303

**Examiner:** E. Lee

**Group Art Unit:** 2815

**Attorney Docket No.:** 2269-3442.2US  
(96-0428.00/US)

**NOTICE OF EXPRESS MAILING**

Express Mail Mailing Label Number: EL995990316US

Date of Deposit with USPS: February 23, 2006

Person making Deposit: Timothy Palfreyman

**COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE**

Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The Examiner indicates:

The references of record, either singularly or in combination, do not teach or suggest at least "a metallization structure comprising a conductive line for transmitting a signal laterally across the substrate, the conductive line consisting essentially of: a metal layer; a single conducting layer overlying and substantially coextensive with the metal layer, the single conducting layer defining an upper surface of the conductive line, the single conducting layer selected from the group

consisting of aluminum and copper; and metal spacers extending at least substantially to a height of the sidewalls of the single conducting layer and metal layer” (claims 1-4, 7, 9-15, and 100). Hata 0502647 A2 EPO does not disclose the titanium nitride cap (single conducting layer) selected from the group consisting of aluminum and copper. It would not have been obvious to make the titanium nitride cap either aluminum or copper since the metal line 18 underneath is already aluminum. Further, the cited prior art does not disclose the single conducting layer defining an upper surface of the conductive line, rather, the cited prior art discloses metal layers enclosing the single conducting layer so that the single conducting layer does not define an upper surface of the conductive line.

Regarding claims 102-104, 107, and 109-115, the references of record, either singularly or in combination, do not teach or suggest at least “a structure for transmitting a signal across a semiconductor device, the structure comprising a conductive line, the conductive line consisting essentially of: a metal layer; a single conducting layer overlying and substantially coextensive with the metal layer, the single conducting layer defines an upper surface of the conductive line, the single conducting layer selected from the group consisting of aluminum and copper; and metal spacers extending at least substantially to a height of the sidewalls of the single conducting layer and metal layer.”

Regarding claims 16-25, and 101, the references of record, either singularly or in combination, do not teach or suggest at least “a metallization structure, comprising a substrate having a metal layer extending over the substrate, the metal layer at least underlying a conductive line; a conductive layer of the conductive line in contact with the metal layer and the metal spacer, the metal spacer and the conductive layer substantially filling the aperture, the conductive layer having an upper surface substantially coincident with an upper surface of the dielectric layer.”

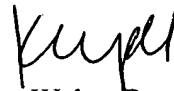
Regarding claims 26-28, the references of record, either singularly or in combination, do not teach or suggest at least “a metallization structure, comprising a substrate having a metal layer extending over the substrate, the metal layer at least underlying a conductive line; a conductive layer of the conductive line in contact with the metal layer and the metal spacer, the metal spacer and the conductive layer nearly filling the aperture, at least one upper metal layer on the conductive layer, the at least one upper metal layer having an upper surface substantially coincident with an upper surface of the dielectric layer and an uppermost extent of the metal spacer.”

Regarding claims 116-125, and 129, the references of record, either singularly or in combination, do not teach or suggest at least “a structure for transmitting a signal laterally across a substrate, the structure comprising: a substrate having a metal layer of a conductive line; a conductive layer of the conductive line in contact with the metal layer and the metal spacer, the conductive layer having an upper surface substantially coincident with an upper surface of the dielectric layer.”

Regarding claims 126-128, the references of record, either singularly or in combination, do not teach or suggest at least “a structure for transmitting a signal laterally across a substrate of a semiconductor device, the structure comprising: a substrate having a metal layer of a conductive line disposed thereon; a conductive layer of the conductive line in contact with the metal layer and the metal spacer, the metal spacer and the conductive layer nearly filling the aperture; and at least one upper metal layer on the conductive layer having an upper surface substantially coincident with an upper surface of the dielectric layer and an uppermost extent of the metal spacer.”

Applicant concurs with the reasons as stated by the Examiner insofar as they comprise a summary, and are exemplary and not limiting. However, the independent claims as allowed include other and different language than that specified by the Examiner, and the allowed dependent claims include other and further features and elements. Accordingly, the scope of the claims must be determined from the literal language of each as a whole, as well as equivalents thereof. Additionally, applicant submitted other and further reasons for patentability during prosecution of the above-entitled application, which remarks and arguments are incorporated herein.

Respectfully submitted,



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Date: February 23, 2006  
KWP/ljb:lmh  
Document in ProLaw



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**Notice of Allowance Mailed:**

November 25, 2005

**NOTICE OF EXPRESS MAILING**

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Person making Deposit: Timothy Palfreyman

**TRANSMITTAL LETTER**

Mail Stop Issue Fee  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

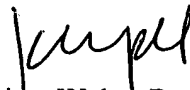
Applicant submits herewith Part B - Fee(s) Transmittal for the above-captioned application and a check in the amount of \$1,715.00 in payment therefor plus five (5) copies of the patent when issued.

Serial No. 09/388,031

Also enclosed are Amendment Pursuant to 37 C.F.R. § 1.312(a); Comments on Statement of Reasons for Allowance; and Fee Addressee for Receipt of PTO Notices Relating to Maintenance Fees.

Applicant understands that no additional fees are required. However, if the Office determines that any comparison fees or other additional fees are required, the Commissioner is authorized to charge any such fees to TraskBritt Deposit Account No. 20-1469. A copy of this Transmittal Letter is enclosed for deposit account charging purposes.

Respectfully submitted,



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Date: February 23, 2006

KWP/dlm:lmh

Enclosures: Part B - Issue Fee Transmittal

Check No. 22563 in the amount of \$1,715.00

Copy of Transmittal Letter

Amendment Pursuant to 37 C.F.R. § 1.312(a) (24 pages)

Comments on Statement of Reasons for Allowance (3 pages)

Fee Addressee for Receipt of PTO Notices Relating to Maintenance Fees (2 pages)

Document in ProLaw